UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/639,674	08/10/2000	Kuang-Shyr Wu	TD0044CH	1587

7590 07/16/2003

W Wayne Liauh Ph D J D
Law Office of Liauh and Associates
Ste 5 388
4224 Waialae Ave
Honolulu, HI 96816

EXAMINER	
MILLER, RYAN J	
ART UNIT	PAPER NUMBER
2621	2

DATE MAILED: 07/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/639,674	WU, KUANG-SHYR	
	Examiner	Art Unit	
	Ryan J. Miller	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 August 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: "60", "70", "80", and "90" of Fig. 6. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities: On page 9, line 3, the specification calls for "verification by Attachments 1 through 4". What are these attachments? The examiner found no attachments in the file.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Independent claim 1 recites "a spin encoder" for generating encoded information whose length is a multiple of the original information and the use of "cross encoding" for permuting the encoded information. These elements of the claim are not described in the specification in such a way as to enable one skilled in the art to make or use the invention.

First of all, the applicant describes, at page 5, lines 18-20, that spin encoding is a type of channel encoding that is used to make the encoded information free from noises during transmission. The specification goes on to describe that the spin encoding is used to generate information that is twice that of the embedded information (see page 6, lines 2-3) and then provides a diagram of a (2,1,3) spin encoder (see Fig. 2). The specification further states that "the extra encoding information is used to correct the transmission errors or human damages" (see page 6, lines 3-4). However, the specification never describes how the "spin encoder" works. No information is provided to describe the information to be embedded into the "spin encoder". It is also not described what type of information is output by the "spin encoder". The specification merely states that it is twice that of the embedded information.

Next, the applicant describes, at page 6, lines 15-22, that a key can be "cross" generated to permute the 8 bits of information for "cross effects". The applicant further describes that this method has greater randomness, does not need to store the whole table, and needs only one initial value (see page 6, lines 22-24). However, the specification never describes the details that show how the "cross encoding" provides the previously mentioned benefits. The specification merely provides the hardware structure shown in Fig. 3 and an inadequate description. The description of "cross encoding" provided by the applicant would not enable one skilled in the art to make and/or use the claimed invention.

Furthermore, the terms "spin encoder" and "cross encoding" are not well known terms in the art. Therefore, the examiner must rely on the applicant's disclosure to define these terms. While an applicant is entitled to be his or her own lexicographer, any special meaning assigned to a term "must be sufficiently clear in the specification that any departure from common usage would be so understood by a person of experience in the field of the invention." Multiform Desiccants Inc. v. Medzam Ltd., 133 F.3d 1473, 1477, 45 USPQ2d 1429, 1432 (Fed. Cir. 1998). The applicant does not make it sufficiently clear in the specification what these terms mean; therefore, it is unclear how the claims, as a whole, should be interpreted.

Claims 2-10, which are dependent upon claim 1, and therefore contain all of the limitations of claim 1, are also rejected for the same reasons as stated above.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 1, the claim calls for a "spin encoder" for generating encoded information. A "spin encoder" is not a well-known term in the art and, therefore, the examiner must rely on the applicant's specification to define this term. The applicant's disclosure does not provide an accurate description of a "spin encoder". What is a "spin encoder"? How does it work? How does it function in the overall system? Clarification is required.

Claim 1 also calls for "cross encoding" for permuting the encoded information. "Cross encoding" is not a well-known term in the art and, therefore, the examiner must rely on the applicant's specification to define this term. The applicant's disclosure does not provide an accurate description of "cross encoding". What is "cross coding"? How does it work? What is its role in the overall system? Clarification is required.

Finally, claim 1 recites the limitation "the B channel" in line 10. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 2, the claim recites the limitation "the spin encoding corrects transmission errors or human damages on the encoded information". This limitation is unclear even in light of the specification. The specification merely states, "the spin encoding corrects transmission errors or human damages on the encoded information" (see page 6, lines 3-4). The specification never describes how this process accomplishes correcting for transmission errors or human damages. Clarification is required.

Regarding claim 5, the claim calls for the step of "spin decoding". This process is not well known in the art, nor is it aptly described in the specification. Clarification of this process is required.

Regarding claim 6, the claim language defines $ASET_{ij}$ as the four pixels surrounding and to the right of any pixel in the host image. However, the specification lacks a clear description of the function of $ASET_{ij}$. This limitation lacks any definite meaning. Clarification of this issue is required.

Regarding claim 8, the claim provides what appears to be pseudo-code as limitations. This code, however, is difficult to read and follow and lacks any definite meaning even in light of the disclosure. Clarification is required.

Claims 3, 4, 7, 9, and 10 are rejected as depending from rejected claims.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 1, 2, and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Acharya et al. (U.S. Patent No. 6,449,380 B1).

As applied to claim 1, Acharya et al. discloses an information hiding method with reduced fuzziness, which comprises the steps of: inputting the information to be embedded into a spin encoder and generating encoded information whose length is a multiple of the original information (see column 4, lines 10-18: The reference describes that watermark signal information B, which is a 32x32 block, is encrypted into a bit stream $E(B)=N_0N_1N_2N_3\ldots N_m$, where each N represent a byte in the encrypted block E(B). The original watermark information B has a length of 32 bits, where as the encrypted block E(B) will have a length of 8m bits since each N is a byte, which consists of 8 bits. Therefore, the length of the encoded information (i.e. E(B)) is a multiple of the original information (i.e. B).); generating a random number sequence using cross encoding for permuting the encoded information, the seed of the random numbers

being a first key (see column 4, lines 20-25: The reference describes that E(B) is the binary digital signal representation of the encrypted block.); selecting a pixel of a host image using a random number generator as an information embedding point of the encoded information, the seed of the random number generator being a second key (see column 4, lines 34-65: The reference describes the use of a pseudo-random number generation technique to select a pixel location of the compressed image to embed the encrypted block E(B). This technique uses the value Q as described by equation [2] as the seed, and, therefore, the second key.); and embedding the encoded information into the pixel of the host image (see column 4, lines 47-49: The reference describes that the encoded watermark signal (i.e. encoded information) is combined (i.e. embedded in) the compressed image (i.e. host image) based on the pixel location obtained from the pseudo-random number generation technique).

As applied to claim 2, Acharya et al. discloses that the spin encoding corrects transmission errors or human damages on the encoded information (see column 3, lines 38-44: The reference describes that the watermark signal can be blended with the image in a perceptually non-detectible manner (i.e. corrects human damages).).

As applied to claim 5, Acharya et al. discloses extracting the embedded information: using the second key to compute the embedding positions of the encoded information (see column 6, lines 13-17: The reference describes that the pseudo-random process is applied to the seed (i.e. the second key) to determine the location of the embedded information in the compressed image.); using the first key to reconstruct the encoded information and to restore the order before cross encoding; and decoding the encoded information using spin decoding (see column 6, lines 17-22: The reference describes that after all of the bytes of the encrypted

watermark have been extracted, the can be concatenated (i.e. reconstructed) to provide E(B). Once E(B) is determined, the original watermark information B can be obtained.).

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Acharya et al. (U.S. Patent No. 6,449,380 B1) and Schulz (U.S. Patent No. 4,905,176). The arguments as to the relevance of Acharya et al. in the rejection of claim 1 above are incorporated herein.

Claim 3, calls for the random number sequence to be generated by a linear feedback shift register. Although Acharya et al. discloses the use of random number generation, the reference does not teach the use of a linear feedback shift register. However, Schulz et al., in the same problem solving area of random number generation, does disclose the use of such a device (see Fig. 1: This figure shows a linear feedback shift register 20 used as a random number generator.).

As applied to claim 4, Schulz et al. discloses that the linear feedback shift register comprises a plurality of buffers (see Fig. 1: The figure shows that the linear feedback shift register comprises 1-n shift register stages (i.e. a plurality of buffers.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Acharya et al. by adding the use of a linear feedback shift register to generate the random numbers as taught in Schulz because the use of such a device "produces

unpredictable sequences of pseudo-random numbers which prevent an attacker from anticipating subsequent values in the output bit stream" (see Schulz: column 8, lines 48-51). Therefore, the use of such a device will add robustness to the watermarking system.

11. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Acharya et al. (U.S. Patent No. 6,449,380 B1) and Ramaswamy (U.S. Patent No. 5,966,412 A). The arguments as to the relevance of Acharya et al. in the rejection of claims 1 and 5 above are incorporated herein.

Claim 10 calls for the spin decoding to adopt the Viterbi algorithm. Acharya et al. do not disclose the use of a Viterbi algorithm; however, Ramaswamy does disclose the use of such an algorithm (see column 5, lines 5-10: The reference describes using a Viterbi decoder).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Acharya et al. by adding the use of the Viterbi algorithm as taught by Ramaswamy because the use of such an algorithm is "able to error correct corrupted bit streams" (see Ramaswamy: column 5, line 9). Therefore, the use of a Viterbi algorithm will provide more accurate retrieval of the encoded information since the process is able to correct errors in corrupted information.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cox et al. (U.S. Patent No. 5,915,027 A) is pertinent in that it discloses a method of digital watermarking transforms a sequence that is to be encoded into another sequence that contains redundant information (see column 4, lines 41-45).

Reed et al. (U.S. Patent No. 6,590,996 B1) is pertinent in that it discloses advantages of embedding information in the blue channel of an image (see column 35, lines 44-53).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J. Miller whose telephone number is (703) 306-4142. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.

Ryan J. Miller
Examiner
Art Unit 2621

Ryan J. Miller
July 9, 2003

LEO BOUDREAU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600